

Claim Amendments

1. (previously presented) A method for use in parametric audio coding for encoding an audio signal having audio characteristics, wherein a parametric speech production model is used to obtain a set of parameters from the audio signal so as to produce a further audio signal in a decoding stage based on said parameters, said method comprising the steps of:

segmenting the audio signal into a plurality of segments based on the audio characteristics of the audio signal; and  
encoding the segments with different encoding settings.

2. (canceled)

3. (previously presented) The method of claim 1, wherein the characteristics include voicing characteristics in said segments of the audio signal.

4. (previously presented) The method of claim 1, wherein the characteristics include energy characteristics in said segments of the audio signals.

5. (previously presented) The method of claim 1, wherein the characteristics include pitch characteristics in said segments of the audio signals.

6. (original) The method of claim 1, wherein said segmenting is carried out concurrent to said encoding step.

7. (previously presented) The method of claim 1, wherein said segmenting is carried out before said encoding step.

8. (original) The method of claim 3, wherein a plurality of voicing values are assigned to the voicing characteristics of the audio signal in said segments, and wherein said segmenting is carried out based on the assigned voicing values.

9. (original) The method of claim 8, wherein the plurality of values includes a value designated to a voiced speech signal and another value designated to an unvoiced signal.
10. (original) The method of claim 8, wherein the plurality of values further includes a value designated to a transitional stage between the voice and unvoiced signal.
11. (original) The method of claim 8, wherein the plurality of values further includes a value designated to an inactive period in the speech signal.
12. (previously presented) The method of claim 1, further comprising the step of selecting a quantization mode for said encoding in order to improve the bit allocation and to reduce the parameter update rate, wherein the segmenting step is carried out based on the selected quantization mode.
13. (previously presented) The method of claim 1, wherein said segmenting step is carried out based on a selected target accuracy in reconstructing of the audio signal, wherein the target accuracy is selected based on a distortion criteria comparing upsampled quantized values and modified parameter signal.
14. (original) The method of claim 5, wherein said segmenting step is carried out for providing a linear pitch representation in at least some of said segments.
15. (original) The method of claim 1, wherein the audio signal is encoded into audio signal data, said method further comprising the steps of
- forming a parameter signal based on the audio signal data having a first number of signal data;
  - downsampling the parameter signal to a second number of signal data for providing a further parameter signal, wherein the second number is smaller than the first number; and
  - upsampling the further parameter signal to a third number of signal data in decoding, wherein the third number is greater than the second number.

16. (original) The method of claim 15, wherein the third number is equal to the first number.

17. (original) The method of claim 15, wherein the signal data comprise quantized parameters.

18. (original) The method of claim 15, wherein the signal data comprises unquantized parameters.

19. (currently amended) A decoder for use in parametric audio coding for generating [[an]] a further audio signal indicative of an audio signal having audio characteristics, wherein the audio signal is coded in a coding step into a plurality of parameters at a data rate, and the coding step is adjusted based on the characteristics of the audio characteristics of audio signals for providing an adjusted representation of the parameters, wherein said adjusting comprises the steps of segmenting the audio signal into a plurality of segments based on the characteristics of the audio signals and encoding the segments based one or more of a plurality of encoding settings, said decoder comprising:

an input for receiving audio data indicative of the parameters in the adjusted representation; and

a module, responsive to the audio data, for generating the further audio signal based on the adjusted representation and the characteristics of the audio signal.

20. (original) The decoder of claim 19, wherein the audio data is recorded on an electronic medium, and wherein input of the decoder is operatively connected to the electronic medium for receiving the audio data.

21. (original) The decoder of claim 19, wherein the audio data is transmitted through a communication channel, and wherein the input of the decoder is operatively connected to the communication channel for receiving the audio data.

22. (previously presented) A coding device for use in parametric audio coding for encoding an audio signal with audio characteristics, the coding device comprising:

an input for receiving audio data indicative of the characteristics; and

an adjustment module for adjusting one or more parameters based on the characteristics of the audio signal for providing an adjusted representation of the parameters, wherein said adjusting comprises the steps of segmenting the audio signal into a plurality of segments based on the characteristics of the audio signals and encoding the segments based one or more of a plurality of encoding settings.

23. (original) The coding device of claim 22, further comprising a quantization module, responsive to the adjusted representation, for coding the parameters in the adjusted representation.

24. (original) The coding device of claim 22, further comprising an output end, operatively connected to a storage medium, for providing data indicative of the coded parameters in the adjusted representation to the storage medium for storage.

25. (original) The coding device of claim 22, further comprising an output end, operatively connected to a communication channel, for providing signals indicative of the coded parameters in the adjusted representation to the communication channel for transmission.

26. (previously presented) A software product embodied in an electronically readable medium for use in conjunction with a parametric audio coding device, the audio coding device encoding an audio signal with audio characteristics for providing a plurality of parameters indicative of the audio signal, said computer software product comprising:

a code for determining the characteristics of the audio signal; and

a code for adjusting the parameters based on the characteristics of the audio signal for providing an adjusted representation of the parameters, wherein said adjusting comprises the steps of segmenting the audio signal into a plurality of segments based on the characteristics of the audio signals and encoding the segments based one or more of a plurality of encoding settings.

27. (previously presented) An electronic device comprising:

a decoder for use in parametric audio coding for generating a synthesized audio signal indicative of an audio signal having audio characteristics, wherein the audio signal is coded in a coding step into a plurality of parameters at a data rate, and the coding step is adjusted based on the characteristics of the audio characteristics of audio signals for providing an adjusted representation of the parameters, wherein said adjusting comprises the steps of segmenting the audio signal into a plurality of segments based on the characteristics of the audio signals and encoding the segments based one or more of a plurality of encoding settings; and

an input for receiving audio data indicative of the parameters in the adjusted representation for providing the audio data to the decoder, so as to allow the decoder to generate the synthesized audio signal based on the adjusted representation.

28. (original) The electronic device of claim 27, wherein the audio data is recorded in an electronic medium, and wherein the input is operatively connected to the electronic medium for receiving the audio data.

29. (original) The electronic device of claim 27, wherein the audio data is conveyed through a communication channel, and wherein the input is operatively connected to the communication channel for receiving the audio data.

30. (original) The electronic device of claim 27, comprises a mobile terminal.

31. (currently amended) A communication network, comprising:

a plurality of base stations; and

a plurality of mobile stations adapted to communicating with the base stations, wherein at least one of the mobile stations comprises:

a decoder for use in parametric audio coding for generating a synthesized audio signal indicative of an audio signal having audio characteristics, wherein the audio signal is coded in a coding step into a plurality of parameters at a data rate, and the coding step is adjusted based on the characteristics of the audio characteristics of audio signals for providing an adjusted representation of the parameters, wherein said adjusting comprises the steps of segmenting the audio signal into a plurality of segments based on the

characteristics of the audio signals and encoding the segments based one or more of a plurality of encoding settings; and

an input for receiving audio data indicative of the parameters in the adjusted representation from at least one of the base stations for providing the audio data to the decoder, so as to allow the decoder to generate the synthesized audio signal based on the adjusted representation.

32. (previously presented) A decoder for reconstructing an audio signal in a parametric audio coder, wherein the audio signal is encoded for providing parameters indicative of the audio signal, the parameters including pitch contour data containing a plurality of pitch values representative of an audio segment in time, and wherein the pitch contour data in the audio segment in time is approximated by a plurality of consecutive sub-segments in the audio segment, each of said sub-segments defined by a first end point and a second end point, said decoder comprising:

an input for receiving audio data indicative of the end points defining the sub-segments;  
and

a reconstruction module for reconstructing the audio segment based on the received audio data.

33. (previously presented) The method of claim 1, wherein the encoding settings include bit allocation, quantization accuracy, quantization method and parameter update rate.

34. (previously presented) The method of claim 1, wherein the audio signal contains sinusoidal components and said parameters include frequency values, amplitude values and phase values indicative of the sinusoidal components.

35. (previously presented) The method of claim 1, wherein the parameters include pitch, voicing, amplitude and energy of the audio signal.

36. (previously presented) The method of claim 1, wherein the parameters include pitch contour data containing a plurality of pitch values representative of an audio segment in time.

37. (previously presented) The decoder of claim 19, wherein the encoding settings include bit allocation, quantization accuracy, quantization method and parameter update rate.

38. (previously presented) The coding device of claim 22, wherein the encoding settings include bit allocation, quantization accuracy, quantization method and parameter update rate.

39. (previously presented) The software product of claim 26, wherein the encoding settings include bit allocation, quantization accuracy, quantization method and parameter update rate.

40. (previously presented) The communication network of claim 31, wherein the encoding settings include bit allocation, quantization accuracy, quantization method and parameter update rate.

41. (new) The method of claim 1, wherein the audio signal comprises a plurality of frames and the audio signal in each frame has a waveform and wherein the further audio signal is produced in the decoding stage independently of the waveform.

42. (new) The method of claim 1, wherein each segment has a segment length and wherein the segment length of at least one segment is different from the segment length of at least one other segment.

43. (new) The decoder of claim 19, wherein the audio signal comprises a plurality of frames and the audio signal in each frame has a waveform and wherein the module generates the further audio signal independently of the waveform.

44. (new) The coding device of claim 19, wherein the segments comprise segments of different segment lengths.

45. (new) The coding device of claim 22, wherein the segments comprise segments of different segment lengths.

46. (new) The electronic device of claim 26, wherein the segments comprise segments of different segment lengths.

47. (new) The communication network of claim 31, wherein the segmented and encoded segments comprise segments of different segment lengths.

48. (new) The decoder of claim 32, wherein the sub-segments comprise sub-segments of different segment lengths.